

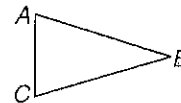
4-6

Study Guide and Intervention

Isosceles Triangles

Properties of Isosceles Triangles An **isosceles triangle** has two congruent sides. The angle formed by these sides is called the **vertex angle**. The other two angles are called **base angles**. You can prove a theorem and its converse about isosceles triangles.

- If two sides of a triangle are congruent, then the angles opposite those sides are congruent. (**Isosceles Triangle Theorem**)
- If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

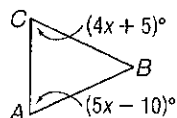


If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong \angle C$.

If $\angle B \cong \angle C$, then $\overline{AB} \cong \overline{AC}$.

Example 1

Find x , given $\overline{BC} \cong \overline{BA}$.



$BC = BA$, so

$$m\angle A = m\angle C.$$

Isos. Triangle Theorem

$$5x - 10 = 4x + 5$$

Substitution

$$x - 10 = 5$$

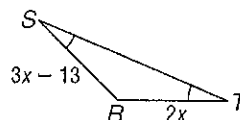
Subtract $4x$ from each side.

$$x = 15$$

Add 10 to each side.

Example 2

Find x .



$$m\angle S = m\angle T, \text{ so}$$

$$SR = TR.$$

Converse of Isos. Δ Thm.

$$3x - 13 = 2x$$

Substitution

$$3x = 2x + 13$$

Add 13 to each side.

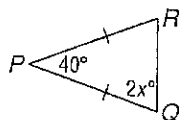
$$x = 13$$

Subtract $2x$ from each side.

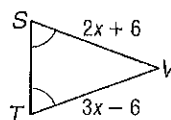
Exercises

Find x .

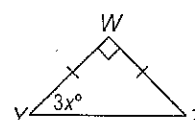
1.



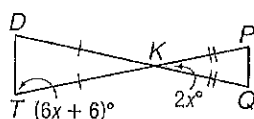
2.



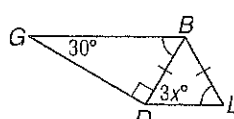
3.



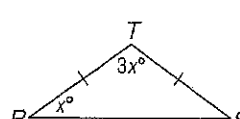
4.



5.



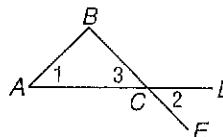
6.



7. Write a two-column proof.

Given: $\angle 1 \cong \angle 2$

Prove: $\overline{AB} \cong \overline{CB}$



Statements

Reasons

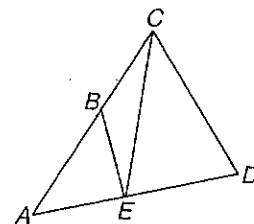
4-6

Skills Practice

Isosceles Triangles

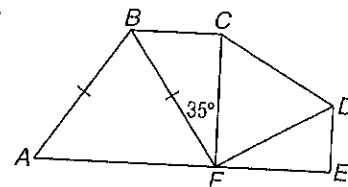
Refer to the figure.

1. If $\overline{AC} \cong \overline{AD}$, name two congruent angles.
2. If $\overline{BE} \cong \overline{BC}$, name two congruent angles.
3. If $\angle EBA \cong \angle EAB$, name two congruent segments.
4. If $\angle CED \cong \angle CDE$, name two congruent segments.



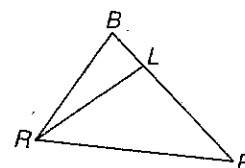
$\triangle ABF$ is isosceles, $\triangle CDF$ is equilateral, and $m\angle AFD = 150$. Find each measure.

5. $m\angle CFD$
6. $m\angle AFB$
7. $m\angle ABF$
8. $m\angle A$



In the figure, $\overline{PL} \cong \overline{RL}$ and $\overline{LR} \cong \overline{BR}$.

9. If $m\angle RLP = 100$, find $m\angle BRL$.
10. If $m\angle LPR = 34$, find $m\angle B$.



11. Write a two-column proof.

Given: $\overline{CD} \cong \overline{CG}$

$\overline{DE} \cong \overline{GF}$

Prove: $\overline{CE} \cong \overline{CF}$

